REMARKS

Claims pending in the instant application are 1-30. Claims 19-21 are allowed. Claims 1-18 and 22-30 presently stand rejected. The specification and claims 1, 6, 10, 15, 19, 22 and 27 have been amended. Claims 1, 10, 22 and 27 have been amended to include elements from the allowable subject matter of claim 19. The Applicant respectfully requests reconsideration of the present application in view of the amendments and the following remarks.

Specification

In the December 18, 2002 Office Action, the disclosure is objected to because of informalities. The specification has been amended to accommodate the objection. No new matter has been added. Accordingly, the Applicant respectfully requests that the Examiner reconsider and withdraw the objection to the specification.

Claim Objections

In the December 18, 2002 Office Action, claims 1 and 19 are objected to because of informalities. Claims 1 and 19 have been amended to accommodate the objections. Accordingly, the Applicant respectfully requests that the Examiner reconsider and withdraw the claim objections.

35 U.S.C. § 102 and 103 Rejections

In the December 18, 2002 Office Action, claims 1-3, 6, 7, 10-12, 15, 16, 22, 23, 25-27, 29 and 30 are rejected under 35 U.S.C. § 102(b) as being anticipated by Doerr et al., U.S. Patent Number 5,987,050. Claims 4, 5, 8, 9, 13, 14, 17, 18, 24 and 28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Doerr.

Claim 1 as presently amended recites, in pertinent part, a "phase modulator, comprising:

a phase modulator input port and a phase modulator output port respectively coupled to the input port and the output port of the optical cavity;

a first optical combiner coupled to the phase modulator input port; and

a second optical combiner coupled to the phase modulator output port."

Doerr is directed to a laser transmitter. However, Doerr fails to disclose, teach, or fairly suggest the Applicant's expressly recited limitation of "a first optical combiner coupled to the phase modulator input port; and a second optical combiner coupled to the phase modulator output port."

Therefore, since at least one of the expressly recited elements of the presently claimed invention are not disclosed, taught, or fairly suggested in the cited references, the Applicant submits that the presently claimed invention is neither anticipated nor rendered obvious in view of Doerr. Independent claims

10, 22 and 27 distinguish for at least the same reasons as claim 1. The remaining claims 2-9, 11-18, 23-26 and 28-30 are dependent claims and distinguish over the cited reference for at least the same reasons as their respective independent base claims in addition to adding further limitations of their own. Accordingly, the Applicant respectfully requests the instant §§ 102 and 103 rejections be withdrawn and that the presently claimed invention is in condition for allowance.

CONCLUSION

The Applicant submits that in view of the amendments and arguments set forth herein, all instant objections and rejections have been overcome and should be withdrawn. Therefore, the Applicant respectfully requests the Examiner to issue a timely Notice of Allowance in this case.

Attached hereto is a marked up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE."

Charge Deposit Account

Please charge our Deposit Account No. 02-2666 for any additional fee due in this matter.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

Date: Feb. 7, 2003

Lawrence E. Lycke
Reg. No. 38,540

12400 Wilshire Blvd., Seventh Floor
Los Angeles, CA 90025-1030
(206) 292-8600

FIRST CLASS CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231

on February 7, 2003
Date of Deposit

Dominique C. Valentino
Name of Person Mailing Correspondence

Dominique Valentino
Signature

2-7-03
Date

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

The paragraph beginning at line 10 of page 6 has been amended as follows:

In this embodiment, MZI structure 14 includes optical coupler 24, optical coupler 25 and a phase shifter 26. Optical couplers 24 and 25 are also referred herein as optical combiners 24 and 25. For example, optical coupler 24 can be implemented using a standard 50:50 coupler such as, for example, a Y-coupler, a beam-splitter prism, or any other optical power splitter device. Optical coupler 25 can also be a 50:50 coupler. In other embodiments, the splitters can have arbitrary power splitting ratios. Phase shifter 26 can be any suitable phase shifting device such as, for example, electro-optic, thermo-optic and stress-optic phase shifters. In this embodiment, phase shifter 26 varies the phase of an optical signal by varying the refractive index of the medium in which the optical signal is propagating. Other embodiments may use phase shifters that create phase differences using different approaches or mechanisms.

The paragraph beginning at line 17 of page 8 has been amended as follows:

However, partially reflective facet 22 also reflects a portion of the recombined optical signal to propagate back to partially reflective facet 21 via optical coupler 25, arms 28A and 28B, and optical coupler 24. More particularly, (a) optical coupler 25 splits the reflected signal to propagate in arms 28A and 28B; (b) phase shifter 26 introduces another relative phase shift between the component signals outputted by signal combiner 25; (c) optical coupler 24 combines these component signals; and (d) partially reflective [facer]facet 21 reflects a portion of the recombined output signal of optical coupler 24. This reflected portion in effect, is then operated on as described in block 31 and so on. Thus, in effect, portions of input optical signal 16 are confined in optical cavity 12 (defined by partially reflective facets 21 and 25) for multiple passes through MZI structure 14 (formed by phase shifter 26 and optical couplers 24 and 25). As a result, these portions of the optical signal can accumulate the phase shifts introduced by phase shifter 26 before exiting partially reflective facet 22.

IN THE CLAIMS

1. (Amended) An optical switching device, comprising:

an optical cavity having an input port and an output port; and

a phase modulator disposed within the optical cavity, the phase modulator [having] ,comprising:

[an]a phase modulator input port and [an]a phase modulator output port respectively coupled to the input port and the output port of the optical cavity[,];

a first optical combiner coupled to the phase modulator input port; and

a second optical combiner coupled to the phase modulator output port,

wherein the phase modulator [introduced]to introduce a phase shift in a portion of an optical signal propagating in the optical cavity [while the component signal is propagating] in one direction, and to introduce[s] a phase shift in another portion of the optical signal propagating in another direction.

6. (Amended) The optical switching device of claim 2 wherein the [MZI comprises a] first and second optical combiners are each a Y-coupler.

10. (Amended) An optical switching device, comprising:

an optical cavity having an input port and an output port; and

means, disposed within the optical cavity, for modulating a phase of a portion of an optical signal propagating in the optical cavity, the means for modulating including a first optical combiner, disposed within the optical cavity, coupled to the input port and a second optical combiner, disposed within the optical cavity, coupled to the output port.

15. (Amended) The optical switching device of claim 11 wherein the [MZI comprises] first and second optical combiners are each a Y-coupler.

19. (Amended) A planar [optical] integrated optical circuit, comprising:

a first facet having a reflectance less than one;

a second [fact]facet having a reflectance less than one[']:

a first optical combiner coupled to the first facet;

a second optical combiner coupled to the second facet;

a first arm having one end coupled to the first optical combiner and another end coupled to the second optical combiner;

a second arm having one end coupled to the first optical combiner and another end coupled to the second optical combiner; and

a phase shifter operatively coupled to the first and second arms.

22. (Amended) A method, comprising:

propagating an optical signal into an optical cavity through a first input port disposed within the optical cavity;

causing a portion of the optical signal to propagate in one optical path and another portion of the optical signal to propagate in another optical path using a first optical combiner coupled to the first input port;

selectively introducing a phase difference between the portions of the optical signal within the optical cavity;

combining the portions of the optical signal using a second optical combiner; and

propagating a portion of the combined signal out of the optical cavity through an output port coupled to the second optical combiner.

27. (Amended) An optical switching device, comprising:

an optical cavity;

means for propagating an optical signal into the optical cavity;

a first optical combiner, wherein the first optical combiner to cause [means for causing] a portion of the optical signal to propagate in one optical path and another portion of the optical signal to propagate in another optical path, coupled to the means for propagating an optical signal into the optical cavity;

means for selectively introducing a phase difference between the portions of the optical signal disposed within the optical cavity;

a second optical combiner to combine[means for combining] the portions of the optical signal; and

means for propagating a portion of the combined signal out of the optical cavity coupled to the second optical combiner.